What Is Claimed Is

1. A communication network comprising:

a plurality of optical links;

a plurality of amplifiers, coupled to the links for amplification of optical signals transmitted through the links wherein the amplifiers have a common gain profile with respect to a predetermined range of wavelengths; and

a plurality of transmitters of optical signals wherein the members of the plurality emit signals at predetermined, different output parameter values wherein the values are selected in accordance with the gain profile.

2. A communication network as in claim 1 which includes transmitter drive circuits, coupled to the transmitters wherein the drive circuits drive the transmitters at power levels selected in accordance with the gain profile.

3. A communication network as in claim 1 wherein the transmitter output parameter values are selected in accordance with an inverse of the gain profile.

4. A communication network as in claim 2 wherein the transmitter output power levels are selected in accordance with an inverse of the gain profile.

5. A communication network as in claim 1 which includes at least one optical receiver wherein the receiver exhibits an input range and signals coupled to the receiver, in accordance with transmitter parameter output values, fall within the input range.

6. A communications network comprising:

a plurality of optical transmission links;

a plurality of gain elements wherein at least one gain element is coupled to each link and wherein the members of the plurality exhibit a common gain profile; and

a plurality of channel based radiant energy beams wherein the beams exhibit a pre-set profile for a selected parameter in accordance with an inverse of the common gain profile.

7. A network as in claim 6 wherein at least some of the energy beams are transmitted through up to a pre-determined number of links and wherein the pre-set profile comprises an inverse of the common gain profile raised to an exponent corresponding to the number of links.

8. A network as in claim 6 which includes pre-emphasis circuits coupled to at least one source of the beams.

9. A network as in claim 8 wherein the pre-emphasis circuits establish a power output profile for the source, on a per channel basis, in accordance with the inverse of the common gain profile.

10. A compensation process for a network comprising:

evaluating variations in amplifier gain over a selected range of wavelengths;

establishing an inverse function of the gain variations; and

setting an output parameter of an optical transmitter in accordance with a corresponding value of the inverse function on a per wavelength basis.

11. A process as in claim 10 which includes:

in the establishing step raising values of the inverse function to a predetermined power.

12. A process as in claim 11 which includes in the establishing step, raising values of the inverse function to a power selected from a class which includes the values 2-10.

13. A process as in claim 10 which includes setting an output parameter for each one of a plurality of optical transmitters in accordance with a corresponding value of the inverse function selected from a plurality of corresponding wavelengths.

14. A process as in claim 13 which includes, prior to the setting step, raising selected values of the inverse function to a predetermined exponent.

15. A process as in claim 13 which includes providing a plurality of optical transmitters.

16. A process as in claim 15 wherein the providing step comprises providing a plurality of lasers as optical transmitters.

17. A process as in claim 16 comprising setting a power output parameter for each member of the plurality of lasers in accordance with a corresponding value of the inverse function.

18. A process as in claim 17 which includes dynamically altering laser power settings in accordance with changing network parameters.

19. A process as in claim 17 which includes providing pre-set laser modules for installation in a network where the number of optical spans between a module and a respective receiver is not larger than the exponent.

20. A process as in claim 19 wherein the laser modules each have substantially the same power output profile.

21. A network comprising:

a plurality of optical transmission elements wherein each element includes,

an optical fiber;

a first amplifier coupled to an input end of the fiber and a second amplifier coupled to an output end of the fiber wherein elements are coupled so as to provide one or more sets of up to S cascaded signal conducting elements;

a plurality of transmitter modules wherein each module comprises circuits for outputting a plurality of radiant energy beams, on a per channel basis, wherein the beams have a power output profile in accordance with an inverse of the gain profile of the elements.

22. A network as in claim 21 wherein the inverse of the gain profile is raised to the exponent S to establish the power output profile.

23. A network as in claim 21 wherein the members of the plurality are coupled to light paths of differing lengths wherein a power output variation parameter, associated with the various light paths, is less than a predetermined maximum value.

24. A network as in claim 23 wherein the light paths each have a length which does not exceed S spans.

25. An optical network comprising:

a plurality of optical links;

a plurality of amplifiers coupled to respective links wherein at least some of the amplifiers exhibit common gain profiles;

a plurality of optical transmitters coupled to an input of a selected link; and

pre-emphasis adjustment circuitry coupled to the members of the plurality of transmitters whereby each transmitter's output power is set in accordance with an inverse of the gain profile.

26. A network as in claim 25 wherein the pre-emphasis circuitry sets each transmitters' output power in accordance with the inverse gain profile.

27. A network as in claim 26 which includes an optical receiver coupled to an output of a respective optical link wherein S optical links extend between the

plurality of transmitters and the receiver and wherein *S* does not exceed the value of the exponent.

28. A network as in claim 27 wherein less than *S* optical links extend between the plurality of transmitters and the receiver and wherein the exponent equals *S*.

29. A network as in claim 27 wherein the receiver has an input sensitivity range on the order of 2SdB.

30. A transmitter module for use in an optical network wherein members of a first plurality of amplifiers and members of a second plurality of amplifiers couple signals between optical spans wherein an amplifier from each plurality is associated with each span, the module comprising:

a plurality of optical emitters for providing optical signals to be transmitted through up to a predetermined maximum number of optical spans and associated amplifiers; and

circuitry coupled to the emitters for adjusting an output parameter profile of the emitters in accordance with an inverse of a composite amplifier gain profile wherein the composite profile incorporates a common gain profile associated with members of each plurality.

31. A pre-emphasis method comprising:

establishing a gain profile across a range of wavelengths for at least one multi-channel light path;

forming an inverse of the gain profile;

establishing the widest acceptable receiver input power variation and determining a maximum number of allowable cascaded light paths in response thereto;

raising the inverse of the gain profile to an exponent which corresponds to the maximum allowable number of light paths to form a processed inverse profile; and

setting transmitter output power in accordance with the inverse profile.